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AUTHOR Mace-Matluck, Betty J.; And Others

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ABSTRACT

To gather information to assist policy makers, curriculum designers, and classroom teachers in planning and delivering language and reading instruction that will promote success in school of children from complex language backgrounds, a 6-year longitudinal investigation begun in 1978 tracked approximately 250 Spanish-speaking children from low income families taught by over 200 teachers in 20 schools in 5 Texas school districts from kindergarten through second or third grade. Oral language proficiency tests, teacher ratings, and audiotaped interactions were used to evaluate oral skills development while reading achievement was measured using Spanish and English versions of the Interactive Reading Assessment System and other standardized tests. Issues considered as a result of study findings included valid language assessment, language criteria for program placement, length of stay in bilingual programs, language development and reading acquisition, pre-reading skills development, rate/pattern of language/reading growth, transfer of skills across languages, precursor skills, nominal instructional programs, quantity and quality of instruction, practices associated with less student gains, and site characteristics. Based on correlation and regression results, predictor variables of kindergarten entry language skills, performance during the previous year, and the quantity and quality of reading instruction were most strongly related to reading achievement within each of the instructional years. A two-page list of references concludes the document. (NEC)

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A K-4 LONGITUDINAL STUDY

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Southwest Educational Development Laboratory

LANGUAGE, LITERACY, AND INSTRUCTION IN BILINGUAL SETTINGS:

A K-4 LONGITUDINAL STUDY

Betty J. Mace-Matluck
Wesley A. Hoover
Robert C. Calfee

Preston C. Kronkosky
Southwest Educational Development Laboratory
Austin, Texas

November 1985

This monograph is based on the eight-volume report for the

TEACHING READING TO BILINGUAL CHILDREN STUDY

by the Southwest Educational Development Laboratory:

Volume 1 - Introduction

Volume 2 - Design of the Study

Volume 3 - Measurement of Growth

Volume 4 - Oral Language Growth

Volume 5 - Reading Growth

Volume 6 - Instruction

Volume 7 - Language, Literacy, and Instruction: Integrating the Findings

Volume 8 - Executive Summary

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INTRODUCTION

Each year the numbers of Hispanic children enrolled in the nation's schools increase. In the State of Texas approximately one-third of the school children are from Spanish language backgrounds, with 50 percent of the current kindergarten population Hispanic. This pattern of growth is repeated in all the US-Mexico border states and, to a lesser extent, throughout the country.

Implications for the social, economical and political future of the United States are clear. If these children fail to learn and achieve in school, the nation loses a vast resource, and risks, in the next generation, disaffection and economic and social alienation.

Generally, children from Spanish language backgrounds, for many reasons, encounter difficulty in our nation's schools. It is well-documented that these children do more poorly than the general school population on standardized achievement tests and their dropout rate is higher.

However, the Hispanic population is far from homogeneous. Differences within the group include degree of bilingualism, length of family residence in the United States (immigrant versus long-term settlement), country or region of origin, socioeconomic conditions, mobility, ways in which English and Spanish are used in the various domains of life and thought, and experience with print both in and out of school.

The overwhelming majority of those who experience difficulty in learning to read and write in school are members of low income families and live in environments where Spanish is widely used both in the home and in the community.

Given these circumstances and the startling lack of solid evidence about which approaches or combinations of approaches are most effective in teaching Hispanic children, the National Institute of Education contracted with the Southwest Educational Development Laboratory (SEDL) to conduct a comprehensive, six-year longitudinal investigation of the development of language and reading skills during the primary grades for a representative sample of Spanish-speaking children from low income families in Texas.

The goal of the research, begun in 1978, was to gather information to assist policy makers, curriculum designers and classroom teachers in planning and delivering language and reading instruction that will promote success in school of children from complex language backgrounds.

Among the questions were the following.

-- What constitutes a favorable learning environment for children from Spanish-language backgrounds?

-- What instructional sequences and events promote successful and efficient learning of oral language and reading? Spanish reading instruction first and for how long? Oral language concentration for how long? How long the transition to all-English instruction?

-- Do current school practices help Hispanic children gain language and literacy success?

The arguments of 1978 continue today. Disagreement abounds about how to effectively teach children from Spanish-language backgrounds to read in English and move in confidence through an English-speaking society. On an instructional level, these issues include the following.

-- How to derive a valid assessment of a child's language of the home (Spanish) and the language of the school (English).

-- How to determine the optimal balance of formal instruction in English and Spanish.

-- How to effectively transfer the skills of one language to the other.

-- How to provide bilingual support within the classroom environment.

To find out what is actually going on in bilingual classrooms and if the instructional goals are being met, the SEDL investigators tracked more than 250 children, taught by more than 200 teachers, in 20 schools in five school districts from kindergarten through second or third grade (fourth grade in some cases) -- a critical period for the development of literacy.

The researchers studied and described variation in both English and Spanish language abilities of students living in bilingual communities; they documented prevailing practices in reading instruction for bilingual students; and they investigated the relations between the instructional program and student achievement for students with differing language skills when entering school. The findings and their implications are reported in the following pages.

THE CHILDREN

Texas law requires that all children in the state from non-English language backgrounds take an oral language proficiency test (selected at the local school district level) when entering school. If a child's oral English proficiency level, as determined by the test, falls at or below a predetermined cutoff score, the child is placed in a bilingual education program.

A "bilingual program" implies some instruction in the home language (e.g., Spanish) for a given period of time. The children in the sample had been diagnosed as Limited English Proficient when they entered school -- kindergarten or first grade, and were enrolled in bilingual education programs.

For the study, sites -- and children -- were selected to include a variety of socioeconomic status (but predominantly low), a range of Spanish-English language usage in the community, and both rural and urban areas. The following geographical regions were selected.

Central Texas -- a region both urban and rural, with a number of bilingual programs.

Texas Border Area -- a rural region, with low socioeconomic conditions and with substantial numbers of Spanish-dominant students.

North Central Texas -- a largely monolingual English region, including both large urban centers and middle-sized cities, with both low and middle class socioeconomic conditions.

From these regions, five school districts were selected that were broadly representative of the variables important to the study -- size, socioeconomic status of the community, variety of schools, programs, and teachers within the district, and willingness to be a part of the study.

Schools within the districts were selected to include different kinds of reading programs and different patterns of school organization (e.g., multiple grading, team teaching, open classroom configurations, and individually-guided education programs).

Initially, 14 schools were selected. As students moved through the grades, sometimes entering other schools, six additional schools were added. The investigators had no control of student placement.

At first, 26 homeroom classes were involved in the study. Team teaching and other organizational approaches added 11 additional teachers to the initial teacher/classroom sample, for a total of 37.

All the children in the sample were eligible for state-mandated bilingual instruction. But just what did these children know at the beginning of the study? What kind of pre-reading skills did they have?

Assessment of their skills at entry revealed the following information.

-- The children were not academically disadvantaged. They came to school with sufficient skills to begin learning to read.

-- Approximately half of the students in the sample came to school knowing the letter names of the English alphabet, an accepted predictor of early English literacy.

-- The children had negligible knowledge of the Spanish alphabet. This was expected, given the alphabet's different treatment in the language and culture.

-- Few children could recognize words in either language; however, sight-word recognition was higher in English than in Spanish.

-- The beginning pupils had highly developed visual matching skills.

-- Most of the students readily acquired auditory-phonetic segmentation skills, that is, they could identify and delete beginning phonemes (sounds) from words they could recognize and pronounce when cued by pictures. They demonstrated greater skill with English than Spanish words. Transfer to unfamiliar words was difficult for some.

-- The children had good vocabularies, with slightly greater strengths in English.

-- Many students when they started to school could not successfully retell stories read to them.

-- The children demonstrated ability to transfer skills in visual matching tasks and auditory-phonetic segmentation between the two languages. The children's vocabulary and comprehension were independent <u>across</u> (but not within) the two languages, and alphabet recognition tended to be related across the two languages.

INSTRUCTION

Ralph Waldo Emerson defined a teacher as a person "who can make hard things easy." The successful bilingual teacher does just that -- takes words and symbols foreign to the young child, imbues them with meaning, and systematically gives them to the child. The child then accepts them as his very own, to become his tools for communicating, learning and living.

The 37 teachers were initially selected to participate in the SEDL study on the basis of number of years of experience, their specialized training in reading and bilingual education, number of years at the present school, and use of teacher aides.

The sample teachers fit the following profile.

-- All held Texas Education Agency (TEA) certification with bilingual endorsement.

-- They reflected wide variation in number of years of teaching experience and experience in teaching in bilingual classrooms -- from first year teachers to veterans.

-- In the self-contained bilingual classrooms, most of the teachers were Hispanic, fluent speakers of English, and with varying degrees of skills in Spanish -- although all held bilingual endorsement credentials.

-- In team-teaching situations, the teacher who delivered the Spanish instruction component had similar credentials. The teacher who delivered the English component of the curriculum sometimes did and sometimes did not have bilingual skills, but had had preservice or inservice training for teaching English as a second language.

As students moved through the grades, other teachers were added with the total over 200. As the students were transferred to an all-English curriculum, some encountered monolingual English-speaking teachers, but in largely Hispanic communities (3 of the 5 sites). Most of the teachers, however, at all grade levels, were Spanish/English bilinguals.

Project staff conducted monthly observations of the reading instruction in each classroom and quarterly interviews with teachers about their instructional plans.

The observation instrument, the Reading and Mathematics Observation System (Calfee & Calfee, 1976, 1978) documented staffing patterns, grouping and organization, time allocations, the language of instruction, the character of instruction, the materials and procedures used, and the response of the students.

The interview instrument, the Reading Teacher Checklist (SEDL, 1978), focused on the teachers' general instructional objectives for reading, as well as the objectives for individual target students.

The classroom observations and teacher interviews provided rich and extensive data on the instructional program each target child received throughout the study.

How the Children Were Taught

One-third of the 250 bilingual students in the sample began reading instruction in Spanish. Some received Spanish reading instruction for only one year before being transferred to English reading. Others remained in Spanish reading for two, three, or four years. By the end of third grade, most had been transferred to English reading.

The teachers generally followed their instructional plans. The investigators, comparing the classroom observation reports with teacher interviews, generally found the teachers did what they said they were going to do within a given period. Also, the teachers used similar instruction methods in Spanish and English.

In general, the instruction the child received may be described as follows.

-- Size of the instructional reading groups ranged from about 13 in the early grades to about 15 in the later grades.

-- The teacher, not an aide or other instructional person, worked with the students about two-thirds of the time.

-- The role of the teacher, in the aggregate, tended to be one of facilitator, rather than direct instructor.

-- The language of instruction tended to be English during the English reading classes and Spanish during the Spanish reading classes. Some English was used during the Spanish reading periods.

-- About half of the reading instruction time during the first and second grades was focused on decoding; this fell to about 30% by fourth grade.

This instruction tended to involve non-explicit letter-sound pairings at each grade level (e.g., children were shown a word on a flash card and were asked, "What does this word say?" or were asked, "What is the name of this letter?"); little explicit letter-sound work was observed (i.e., direct instruction in or practice on tasks that required the child to overtly focus on a specific isolated linguistic element and relate it to its graphic representation).

-- Little time was spent on developing word meaning.

-- About 30% of the instructional time in the first three years was on instruction in the meaning of sentences and texts (comprehension), with a slight increase in the fourth year.

The quality of this instruction was fairly stable across years, and most often focused on literal facts, rather than on making inferences or synthesizing meanings.

-- Independent work accounted for about half of the instructional time during the first two years, dropping to about 35% in the following years.

-- The level of formal language demand (i.e., the extent to which the activity or task required interaction with connected instructional text, either oral or written, as observed in both independent and group work, was low. It started at a relatively low level in the first year, and increased to mid-level by the last two years.

-- The primary materials used in instruction tended to be basal readers accompanied by workbooks, worksheets, and chalkboard/paper/pencil activities.

-- The number of nonengaged students was low; productivity was rated medium each year, while noise tended to be low.

One of the most important findings revealed in these data is the degree to which instruction was specific in its detail. For decoding, such explicitness is the degree to which the correspondences between letter(s) and sound(s) are isolated for the student. For comprehension, explicitness represents the degree to which text structure is isolated. For both decoding and comprehension instruction, such explicitness was, in the aggregate, low. Thus, the task of determining the underlying relationships was left to the student, with relatively little instructor assistance.

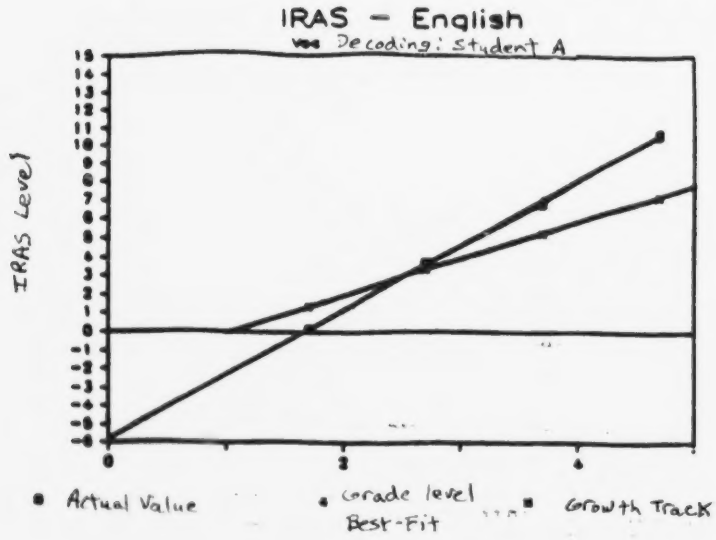
SUMMARY OF FINDINGS -- STUDENTS' PROGRESS

How well did they do -- these children who entered school with "limited English proficiency" and who received in the following years varying amounts of instruction in their home language and in the school language?

The SEDL investigators developed a growth track model to describe the progress children were expected to make in a certain period of time. For a year's instruction, the student was expected to make a year of progress.

With this model, the investigators were able to identify where the students started (not all started at the same place) and to chart the amount of growth each child made each year in oral language skill and in the various components of reading (i.e., vocabulary, decoding, comprehension).

Based on the Interactive Reading Assessment System (IRAS) (Calfee & Calfee, 1979, 1981; Calfee, Calfee, & Pena, 1979), a performance based test of component reading skills, the graph on the following page illustrates how one student's progress in Vocabulary Decoding was tracked according to the growth track model.



A Student's Progress

The student's IRAS levels are shown along the left axis, and grade in school on the bottom margin. The growth track is the "X" line moving from the lower left to the upper right corner of the graph. The track begins at a level of 0.0 for entry to first grade, then moves in a straight line direction, two IRAS levels for each year of schooling, to a value of 8.0 on exit from fourth grade.

This student did not pass the first level of the measure at the end of first grade, but note that he also started behind expectation. The observed score of .17 means that the student managed to read aloud one of the six words in the list of lowest difficulty. By the end of second grade, the student had made considerable progress; with a score of 3.72 on the test, the student was at the expected level. Progress continued during the next two years and was more than a grade level above expectation at exit from fourth grade.

Oral Skills Development

Three types of oral language measures were used in evaluating student progress: an oral language proficiency test, teacher ratings, and audiotaped interactions (language samples). Analyses of the data on progress in oral skills development reveal the following information.

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-- The students in the sample, on entry into school, varied greatly in their degree of bilingualism.

-- The students, generally, made considerable progress in acquiring skill in English, less progress in acquiring Spanish skill.

-- Site differences were apparent in the students' entry facility in Spanish and English and in their subsequent growth in each language.

-- Site differences were also observed in the patterns of language choice, both at entry and over time.

-- The students' oral language proficiency varied, in both languages, depending on the type of measure used (oral language proficiency test versus teacher ratings) as well as by the type of task within a given measure (story retelling versus discrete items that required short-answer responses).

-- When compared to teacher ratings, the oral language proficiency test used appeared to underestimate the students' ability in both languages at entry, and, at higher grades, to overestimate their English abilities and underestimate their skills in spanish.

-- The students made considerable progress not only in learning English grammar but also in acquiring English proficiency in "school-related" language (as reflected in teacher ratings and ratings of audiotaped language samples).

Reading Achievement

To measure the children's reading achievement, the investigators used both IRAS (English and Spanish versions) and standardized reading achievement measures. Longitudinal findings from these follow.

IRAS - English

-- Overall, students entered first grade with English oral language skills exceeding expectations of the growth track model, but grew at the rate of the model predictions. English oral language skills, therefore, were above grade-level expectations throughout the primary grades.

-- Students' decoding skills (of isolated words) were minimal at first-grade entry; they grew at above-level expectations throughout the primary grades. Progress in spelling, however, was slow.

-- Fluency in reading connected text was slow. By second-grade exit, the average student read at a rate of fewer than two syllables per second.

-- Reading comprehension was about half a grade level below expectation at entry. Although growth was slightly above the expected rate, comprehension remained slightly below grade level expectations throughout the primary grades. At fourth grade exit, the overall sample was projected to be within a half grade of that expected by the growth track model.

-- Students who came to school with relatively lower English skills showed greater growth in English oral language capacities. By late fourth grade they had caught up in oral language skills with those students who entered with higher English skills. However, the high English entry students' initial advantage in decoding continued to expand.

-- A significant relation was found between entry level English skills and narrative reading comprehension in English. The high English entry group entered first grade with reading comprehension skills at the expected level, while the low English entry group was about two levels below expectation. Growth rates did not differ. Each proceeded at the rate of about a year of growth for a year of instruction. At fourth grade exit, the high English entry group was projected to be about a half grade level above the growth track model expectations, and the low English group was about one grade level below.

-- Students with relatively higher Spanish oral language skills at entry into kindergarten had growth rates in English reading comprehension that exceeded those of students with relatively lower entry Spanish oral skills. This suggests that although the development of English listening comprehension did not differ for these groups, relatively higher skills in Spanish at school entry promote the growth of English reading comprehension.

IRAS - Spanish

-- Overall, the students entered first grade with Spanish oral language skills exceeding the expectations of the growth track model, but grew at half the expected rate. Although Spanish oral language skills were above grade level at entry, they were projected to fall below grade-level expectations during the primary grades.

-- Decoding skills of the students were minimal at first-grade entry. These skills, as in English, grew slightly above grade-level expectations. Decoding (of isolated words) was above expectations throughout the primary grades. Progress in spelling, however, was slow.

-- As in the English, fluency in reading connected text in Spanish was slow.

-- Reading comprehension was a grade level below expectation at entry and growth was only half the expected rate. Reading comprehension in Spanish was substantially below grade-level expectation throughout the primary grades.

-- Entry level skills in Spanish were related to reading performance in Spanish. The low Spanish entry students started first grade with less skill than the high Spanish group in the areas of formal language and decoding, but subsequent growth did not differ. For reading comprehension, however, the two groups began with the same low-level skills, but, given the greater formal language and decoding skills of the high Spanish entry group, their growth in reading comprehension proceeded at a greater rate. This rate, however, was substantially below that expected from the growth tract model, and the data suggest that the major difficulty for these students was not decoding skill, but difficulty in dealing with the formal language aspects of text.

Relations within and between IRAS Measures (English and Spanish)

-- The highest relations were generally between the component scales within the three major skill areas assessed (formal language, decoding, and reading). The correlations between these skill areas were strongest for decoding and reading, somewhat weaker between formal language and reading, and weakest between decoding and formal language. Thus, the general correlational patterns suggest that decoding and formal language skills are relatively independent, with both needed for growth in reading comprehension.

-- Skill in decoding, and to a lesser degree, in reading, was related across the two languages, while formal language skills (as expected) were generally unrelated. There was, however, a general trend for stronger relationships between a given English task across the set of Spanish tasks when compared to those relationships for the same given Spanish task across the set of English tasks. This suggests that literacy development in English may be more readily transferable to Spanish than from Spanish to English.

Standardized Reading Achievement Tests

Generally, beginning in first grade, standardized achievement tests were administered to all students in the Texas sites in the Spring of each year. Three standardized tests were used in the study's sites: the California Achievement Test, the Comprehensive Test of Basic Skills, and the Iowa Test of Basic Skills. Standardized achievement tests in Spanish were not administered systematically, or to any great extent, by any of the schools in the study. Student performance on the standardized reading achievement tests in English may be summarized as follows.

-- Performance in English indicated that the students in the overall sample entered first grade just slightly below grade-level expectations and showed growth which was also slightly below expectation. By fourth grade exit, the sample was projected to be a grade level behind.

A significant relation was found between entry-level English skills and reading performance in English, as measured by standardized reading achievement tests in english. The low English group began first grade just below grade level expectation, with subsequent growth that gave about three-quarters of a grade-level improvement for each year of instruction. The high English group began first grade slightly above grade-level expectations and grew at a rate that was slightly below expectations. Thus, at fourth-grade exit, the high English entry group was projected to be about a half grade level behind, while the low English entry group was projected to be slightly more than one grade level below grade norms.

Integration of Data Sources

The investigators assessed the degree to which various entry skills and instructional program indices could account for above or below average skill in each instructional year with respect to the set of component reading skills that were of primary interest (decoding, listening comprehension, and reading comprehension).

The predictor variable used included: (a) entry language skill (based on teacher ratings), (b) task-specific entry skill (based on the previous year performance for the task), (c) nominal instructional program (i.e., the number of years of Spanish reading before the child entered exclusive English reading instruction), (d) indices of the quality and quantity of instruction received (based on factors derived from the classroom observation and teacher interview data), and (e) student attendance. In general, these variables were successful as predictors of skill, accounting for 75% to 95% of the variance in each of the nine reading measures in each of the four instructional years.

Based on the correlation and regression results, the predictor variables of kindergarten entry language skill, performance during the previous year, and the quantity and quality of reading instruction were most strongly related to reading achievement within each of the instructional years.

Summary of the English Relationships

-- English kindergarten entry language skill was associated with above average performance in each of the IRAS component literacy skills assessed throughout the early grades.

-- Knowledge of the English alphabet at kindergarten entry was strongly related to decoding-based literacy skills at first grade exit, independently of oral language entry.

-- For a given literacy skill, entry skill was related to exit skill, and increasingly so over grade levels, thus suggesting that students tend to become academically "locked in place" with increased schooling.

-- Enrollment in Spanish reading programs was generally negatively associated with acquired English literacy skill (but much of this relationship is traced to entry level differences). There was some indication of relatively superior English literacy skills at fourth grade exit for those students with longer (longitudinal) enrollments in such Spanish reading programs (though the fourth-grade sample is limited).

-- Relationships for both observed and planned instructional dimensions suggested that (a) literacy skills were advanced by instruction that made strong formal language demands on students, by instruction that employed primary materials, and by instruction that engaged students in work with text materials; and (b) comprehension skills and vocabulary skills were advanced by increased amounts of instructional time devoted to such skill development. Decoding skills showed the opposite relationship, perhaps because of the relatively low quality of such instruction found in this data set.

-- Literacy skills tended to show greater improvement with increased exposure to instruction -- the more opportunity for learning, the greater the skill acquired. This relationship was in many instances not generic in the present data set. Instead, more time on a particular component was correlated with growth in that component.

-- Finally, some site contrasts were evident even after site differences due to entry skill has been removed, but these were relatively isolated.

Summary of Spanish Relationships

-- As was true in the English data, Spanish language level on entry to kindergarten was associated with above average performance in each of the IRAS component literacy skills assessed during all the early grades.

-- Knowledge of the names of the letters in the Spanish alphabet was weakly (though positively) related to first grade exit performance, and, unlike the situation with the English alphabet, did not serve as a general index of preschool literacy skill. However, in all subsequent instructional years, previous performance on a given IRAS scale was related to exit performance on that scale, increasingly so over grade levels. As in English, the relative standing of individual students' literacy in Spanish became more rigid with increased schooling.

-- Enrollment in Spanish reading programs was positively related to Spanish literacy acquisition in the early grades. This association, however, became negligible in the later grades. Given the practice of transferring the most successful students (in Spanish literacy skill) to English classes, it is understandable that length in the program is not substantially related to acquired skill in these later grades.

-- Relationships for both observed and planned instructional dimensions suggest that (a) literacy skills in general were advanced by instruction that engaged students with text materials and by limiting interruptions and (b) decoding skills were advanced by increasing the quantity and quality of decoding instruction and decreasing the number of students in an instructional group.

-- Attendance tended to be positively related to acquired literacy skill, but these relationships were weaker than those found in the English data.

-- Site contrasts, even after entry skill differences had been removed, showed that Spanish literacy skill was more advanced at those border sites that provided the greatest non-school support for Spanish.

IMPLICATIONS OF FINDINGS AND ISSUES RAISED

The bilingual reading classroom is a place of discovery and student insight, of painstaking drill and poring over strange symbols, of experience and the telling of it. The reading classroom, rarely the scene of miracles, is the center from which important relationships emanate between students and teachers, students and students, teachers and parents, students and books.

Sometimes because of lack of information, "static" in communications, organization of the school or the classroom, selection of materials, or others of many possible dissonances, optimal learning fails to take place. It is the educator's duty to create a climate that will enhance children's learning and to suggest and implement improvements in the tools and mechanisms that cause learning to occur.

As the SEDL investigators gathered and analyzed information over the six-year period, a number of critically important instructional issues surrounding language and literacy growth were identified. In the following pages, some of these issues and their implications are discussed.

Valid Language Assessment

ISSUE: The research staff, aware of both the limitations of available measures and the hazards inherent in oral language assess-

ment (give the state of present knowledge about what constitutes oral language proficiency and how to assess it), used multiple measures attempting to obtain a reasonably accurate index of each student's oral language abilities and patterns of language choice over time. Analyses of the oral language data strongly suggest that none of the existing measures by themselves provides adequate information on which to base educational decisions. Use of a variety of types of measures and procedures can, however, provide a reasonably accurate index of the student's oral language abilities. This process is time consuming and requires skill and expertise that often is not readily available to most school districts.

IMPLICATIONS: Given that results of oral language assessment figure prominently in a number of educational decisions and schooling practices for language minority children (e.g., identification, program placement, termination of special services), further research is urgently needed to determine not only effective but practical means for assessing the oral language proficiency of young children.

Language and Instructional Program

ISSUE: When examining language as a precursor skill for reading achievement, additional instructional issues emerge. First, to what extent does the child's language at the time of entry into school determine program placement? By legislative mandate, all children in Texas from non-English language backgrounds, who, at entry into school, score at or below a predetermined cutoff score in English are placed in a bilingual education program. This implies some use of the home language (e.g., Spanish) for instruction for some given period of time. Thus the issue here is not one of access to the program but rather the accuracy and adequacy of the information on which placement decisions are made.

IMPLICATIONS: School districts should be strongly encouraged to use multiple kinds of data from various sources to arrive at decisions about the placement and instructional treatment of language minority children. A formal language measure can provide one kind of information; school personnel's professional judgment about the student's language characteristics in both formal and informal school settings can provide another; the student's academic performance can reveal still further information; and home language surveys and educational histories contribute additional data. Hence, oral language proficiency test scores should not be the only (or even the primary) source of information on which decisions are made.

Secondly, to what extent does the child's language at the time of school entry determine the actual instructional program delivered? The teacher's perceptions of the child's language abilities and instructional needs determine, to a large extent, the instructional treatment delivered to the student. Therefore, in bilingual classrooms, use of the home language for instruction for a given child or group of children will vary, both as a medium of instruction and for

support within the classroom environment. An underlying belief in transitional bilingual education programs is that reading is a single process and that having learned to read in one language, reading in another known language is a matter of transferring and extending one's knowledge and skills. It also is generally believed that bilingual children learn to read more easily and efficiently when their initial reading instruction is in their stronger language. Therefore, transitional bilingual programs may provide initial reading instruction in Spanish for children who clearly are Spanish dominant and, at the time formal reading instruction begins, limited in their English skills. Formal reading instruction usually begins in first grade.

In the present study approximately one-third of the children received initial reading instruction in Spanish. While all of the students in the sample were diagnosed as Limited English Proficient when they entered school and were enrolled in bilingual classrooms when they entered the study (usually as kindergartners), subsequent placement and instructional decisions resulted in the majority of the students being placed initially in English reading instruction.

Length of Stay in Bilingual Program

ISSUE: Length of stay in the program is also determined to a large extent by the teacher's perceptions of a student's readiness to perform in an all-English classroom, as well as by prior instructional treatment and the student's progress in acquiring English. In this study, some students were transferred to a mainstream program at the end of their kindergarten year, presumably because they had either progressed rapidly in acquiring English and were no longer considered Limited English Proficient or at entry their English skills had been underestimated. Other students in the sample scored low in both languages (or were perceived by their teachers to have attained inadequate oral language development in either language), and it was presumed they would do as well in English reading instruction as in Spanish. Still other students who remained in bilingual classrooms in first grade and received initial reading instruction in English may have had sufficient skills in English to be in mainstream reading classes but the diagnosticians believed they needed support in the home language in other curriculum areas.

Thus, contrary to popular belief, not all children enrolled in bilingual classrooms received reading instruction in their non-English home language. Of the students in this study who did receive Spanish reading instruction, most remained in the Spanish program for at least two years.

IMPLICATIONS: Given that teachers' perceptions determine to a large extent the instructional treatment children receive, teachers should be knowledgeable about and have significant input into the oral language assessment process, particularly as related to entry/exit decisions.

Teacher training for assessing oral language assessment needs strengthening. This training should give teachers the skills to be astute observers. They need training in how to observe language behavior as well as in what to observe (e.g., social, personal, and cognitive aspects of oral language proficiency as well as the linguistic dimensions).

Research is needed that

... focuses on how to train teachers to be better observers of language performance, including the content of what is to be observed.

... examines criteria teachers use in making placement (grouping) decisions for reading instruction within a class and for instructional treatment decisions for each of the instructional groups.

... examines, on the state level, how teachers make decisions about bilingual and English-as-a-Second Language students and the extent to which those decisions are congruent with state and local policy; research is also needed that identifies ways in which rules, regulations, and teachers' decisions may converge to arrive at consensus among practitioners and regulatory agencies.

Language Development and Reading Acquisition

ISSUE: To what extent does the child's language development at the time of entry into school affect subsequent reading achievement? The literature includes numerous studies showing a moderate-to-strong relationship between oral language development and reading achievement. Knowledge of the language being read is at the heart of the process. Reading is a derived skill building upon oral language and requiring the translation from writing to a form of language from which the reader already is able to derive meaning. To learn to read, children must bring their knowledge of the spoken language to the written language. A well-developed system of oral language assumes a functional vocabulary and the ability to discover the structure and meaning of spoken utterances. It also assumes a rudimentary ability to reflect upon language allowing children to discover the properties of spoken language central to the correspondence between its written and spoken forms (e.g., awareness of relationships among words in text, as well as among higher-order structural units such as clauses and sentences). Children who do not have a well-developed understanding of the communicative process at school entry often experience difficulties in learning to read and therefore fall below the school's expectations in their academic progress. In the present study, teachers rated the oral language skills of approximately 25% of the students, at entry, as relatively low in both languages. These students were deemed by their teachers to be unable to participate with facility in English in any but very familiar, routine conversa-

tions, and they were characterized as demonstrating less than native or near-native facility in Spanish for students of their age.

IMPLICATIONS: School-based preschool programs and parent involvement components of school programs have gained support as means of enhancing the language development of young children. With adequate attention to staff development, instructional focus, monitoring, and funding, such programs could significantly advance the language development of "high risk" youngsters and should therefore be made more widely available to low-income language minority students.

Research is needed that examines the effects of preschool programs on the language development of language minority children and related effects on subsequent reading achievement.

Pre-reading Skills Development and Reading Achievement

ISSUE: To what extent does the child's pre-reading skills development at entry affect subsequent reading achievement? Children's knowledge about literacy at entry into school has an impact on their reading achievement both in the early stages of literacy acquisition and in later reading achievement. An important question for educators is, "Can instruction change the relative level of attainment in literacy that is predicted by individual differences between children in their knowledge about literacy on entry into school?" A number of studies have shown that differential progress in the acquisition of literacy is related to the quality of instruction children receive. The problem, however, remains. Children who are well prepared at entry to take advantage of what the school has to offer progress at the rate of approximately a year of growth for a year of instruction. Children less prepared often get off to a slow start, and even if they progress at the rate of a year of growth for a year of instruction, they still lag behind their more advantaged peers as they progress in school. Furthermore, these children often become locked into an instructional tract in which the instruction is the same as for other students, only at a slower pace. The students' expectations for themselves decline, as do the expectations of others. The range of instruction delivered is such that these students have limited opportunities to learn more than a narrow range of the skills and content needed to become fluent readers.

IMPLICATIONS: A challenge for the schools is to find means to help prepare the less academically advantaged children to benefit from instruction and to accelerate their growth in the early years so they can keep up with their age group in the general school population. Well-designed preschool programs could expand the knowledge and experience base needed for subsequent academic learning. Further, the whole concept of ability grouping for instruction and instructional "tracking" needs to be closely scrutinized. Such organizational procedures may not be in the best interest of low achieving students.

Rate/Pattern of Language and Reading Growth

ISSUE: To what extent does growth and development of oral language following school entry contribute to reading achievement? Children from a non-English language background who enter school with limited English-speaking skills face mastering the grammar of a new language. But the problem goes far beyond that. The children must learn to communicate in a unique setting for them -- the classroom. As yet little is known about the nature of the linguistic demands faced by children during the critical years of their schooling and about how bilingual children acquire language-use competence for both academic and social purposes. Most children by the age of five have control of the basic structure of their native language and of most of the complexities of conversational interaction. However, when they enter school, children confront a new speech environment with different linguistic requirements to accomplish their informational and social goals. They must, therefore, acquire dimensions of language which many children at school entry have not developed in their native language. The following two examples demonstrate this and define some of the features of what is called "formal" or "school-related" language.

One example involves the interactional rules (or interactional requirements) of the classroom. Although apparently there is no significant "transition" involving grammar, phonology, or even vocabulary in a given language between that required for communicating in the home and the school, differences do occur in the nature of the interactions that take place in the two environments.

Firstly, the relative frequency of types of interaction differ. For example, the three-part structure of the question-answer sequence (teacher-pupil-teacher) occurs with far greater frequency in the classroom, as do pseudo-question where the asker already knows the answer (e.g., Teacher: This is a triangle. Billy, what is this?).

Secondly, the role or status of the participants differs in the two settings. In interpersonal communication, typical of the home, the child shares the responsibility for initiating topics. A two-way flow of new information develops, and meaning is often supported by shared knowledge of the event, as well as by contextual cues from the situation in which the exchange takes place. The reverse is true in the classroom. Most often the teacher initiates the topic and assumes the authority role. The student is the recipient. The flow of new information is a one-way event (knowledge of the event may not be shared by the child). Contextual cues are greatly reduced.

Thirdly, the conversational structure of classroom talk differs, partly because of the pedagogic motivation that underlies much of the talk at school but also because of the special requirement to maintain order in conversation involving large numbers of participants. Thus, children must learn a set of discourse rules for that particular setting (e.g., how to successfully engage the teacher and others to acquire the necessary input for learning; when and under what condi-

tions a turn can be successfully negotiated; how to deal successfully with a specified topic). At entry into school, student competence varies in these special aspects of communication in classroom activities. Success in school depends on adequate knowledge of the rules of classroom discourse, and for many young children this is a major learning task.

A second characteristic of "school-related" language deals with the use and interpretation of language in different contexts. In recent years it has become increasingly clear that users of language acquire skill in both the natural and formal domains of speech and thought. Children, having been reared in the informal and intimate language of the home, come to school with linguistic skills characteristic of natural language, but the school uses formal language in oral discourse in the classroom and in the textbooks. To make academic progress, students have to acquire formal language.

A number of scholars studying the relationship between language and thought describe differences in the use and interpretation of language in face-to-face communication and language used autonomously. In the former, the language is supported by contextual and paralinguistic cues and, therefore, is less dependent on the specific linguistic forms used for its interpretation than on the expectation and perception of the speaker's intentions and the salient features of the context. In contrast, language and thought that moves beyond the bounds of interpersonal context (i.e., formal language) makes different demands on the individual and requires the user to focus on the linguistic forms themselves for meaning, since meaning is autonomously represented and contextual support is greatly reduced. The linguistic message must, therefore, be elaborated precisely and explicitly, whether in the oral or written form.

To a considerable extent, formal education teachers the child to process and produce those varieties of spoken and written language in which meaning is autonomously represented. Language growth equips the child to use language symbolically to represent remote, imaginary, or even hypothetical events and experiences. In acquiring literacy and the spoken form of formal language, children learn to assign meaning to the linguistic forms per se and become conscious of the process by which language can be controlled and manipulated to gain knowledge and to apply that knowledge in a variety of academic and social contexts. Learning to deal with language in this manner is necessary for reading success. Yet it is a difficult process for many children, since it requires learning to view and to use language in a new and expanded way.

In the section reporting the findings of the study, it was noted that the children in the sample developed oral English skills (as assessed through listening comprehension) at a rate exceeding the expectations of the growth track model. The students made considerable progress not only in learning English grammar but also in acquiring the dimensions of English proficiency referred to above as "school-related" language (as reflected in teacher ratings and ratings

of audiotaped language samples; also Klee, 1984). Their oral Spanish skills, in contrast, proceeded at only half the expected rate and were projected to fall below grade-level expectations during the primary grades. The lesser growth in oral Spanish skills can be explained in part by the fact that only about one third of the sample received varying amounts of literacy instruction in Spanish in the early grades, consequently a disproportionate amount of the instruction for the entire group was in English over the course of the study. Nonetheless, mastery of a second language beyond that required for interpersonal communication takes time. Even with considerable emphasis on English reading instruction in the classrooms in the study, the oral English skills of the Low English entry group, while showing greater growth rates than that of the High English group, did not match those of their relatively more English proficient peers until late fourth grade. This findings lends support to other research that suggests that it takes young children several years, on the avarage, to approach grade norms in cognitive/academic skills in their second or weaker language (Cummins, 1983).

Certainly, entry oral language skills had a pervasive effect on various aspects of reading achievement. These skills were associated with entry level skills in decoding in both English and Spanish. Students who entered with relatively higher oral skills tended to have relatively greater skill in decoding than did students with relatively lower oral skills in a given language. However, students in the sample, on the average, learned to decode words in isolation in both languages at rates exceeding grade level expectation and were above grade level expectation in decoding throughout the primary grades. Such performance typically is observed in reading in a second language. However, the rate at which children are able to decode and process linguistic units (decoding fluency) affects reading comprehension. The students' reading rate was slow in both languages (viz., less than two syllables per second by the end of second grade). Possible factors contributing to a slow reading rate include lack of automaticity of decoding skills, inadequate word analysis skills, less than adequate development of oral proficiency, limited knowledge of text structure, and insufficient use of enabling text processing strategies (e.g., using context cues, noting overriding themes, adjusting reading rate to the purpose of the task).

In the aggregate, English reading comprehension, as assessed by the performance-based measure (IRAS), showed growth slightly above the expected rate. However, the students' entry level reading comprehension skills were such that, progressing at the rate of a year of growth for a year of instruction, their reading comprehension remained slightly below grade level expectations throughout the primary grades.

Oral language entry skills were shown to be substantially related to performance in reading comprehension. Students who entered with relatively high English oral skills also entered with better developed reading comprehension skills, and, while growth rates did not differ for the two groups, the advantage of the high English group at entry resulted in this group's consistently higher level of achievement in

reading comprehension. On the other hand, children who entered with relatively higher Spanish oral skills had growth rates in English reading comprehension exceeding that of students who entered with less well developed skills in Spanish. These findings suggest that children who come to school with well developed oral language skills in either or both languages have an advantage in learning to read connected text, as higher oral English entry skills were associated with higher entry English reading comprehension skills, and higher oral Spanish skills were associated with greater growth in English reading comprehension (but not with entry reading comprehension level).

Finally, for standardized tests of English reading, higher entry oral English skills were associated with both higher English reading comprehension entry skills and higher growth rates. Spanish oral skills had no influence on either entry level comprehension skill or growth rate on standardized English reading achievement tests. For high English entry students, who for the most part received their initial reading instruction in English, growth in English reading approached the expected rate, a year of improvement for a year of instruction. For low English entry students, rate of growth in English reading was about three-quarters of a grade-levels improvement for a year of instruction. This can be explained, in part, by the fact that a portion of this group received reading instruction in Spanish for one or more semesters (usually two or more years) before being transferred to English instruction.

IMPLICATIONS: For the students in the study, present schooling practices result in reading achievement on performance-based tests projected to be within a grade level of expectation at the end of fourth grade, with students who entered with relatively higher English skills projected to be slightly above grade level expectations. On standardized reading achievement tests the picture is somewhat different. The overall sample is projected to be about a grade level below expected norms, with the high English entry group approaching grade level norms by the end of fourth grade.

Several studies (Doebler & Mardis, 1980-81; González, 1977; Leyba, 1978; Rosier & Farella, 1976; San Diego City School, 1982; Troike, 1981; Willig, 1985) suggest that the full benefits of initial reading instruction in the home language often are not apparent until students who have received such instruction are in the later elementary grades. A follow-up study of students in this study could provide greater insights into the long-term effects of bilingual education.

Further, some students in the study were deemed by their teachers to have had relatively low oral language skills in both their home language and English on entry into school. Since entry oral language skills were found to be associated with reading performance in important ways, research that can assist schools in working effectively with such students appears to be warranted.

Similarly, effective means for increasing the reading rate (decoding fluency) of children from non-English language backgrounds need to be identified and communicated to teachers, as less than adequate reading rates may be impeding the growth of some of these children in reading connected text.

Transfer of Skills Across Languages

ISSUE: To what extent do knowledge and skills gained in one language transfer to similar tasks in another known language? An underlying premise of transitional bilingual education is that reading skills gained in initial instruction in the home language can be transferred to reading in English and that children, having learned to read successfully in their home language, can be taught relatively easily to read at the same level in English, once oral English skills have reached an acceptable proficiency level. This assumes that transfer of learning will occur after certain conditions are met -- the new knowledge of skill is generalized to the new situation and the child understands the applicability or utility of the knowledge or skill in the new situation.

In the SEDL study, the correlational pattern between the English and Spanish reading measures suggest that a child's knowledge and skills associated with decoding are related across the two languages, as are those associated with overall reading ability, but to a lesser degree. This finding supports the premise that reading is a single process and that reading knowledge and skills gained in one language can be transferred, if the necessary conditions are met, to reading in another known language.

IMPLICATIONS: The practice of teaching children to read initially in their stronger language appears to be educationally sound. However, in commenting on the transfer of learning within a bilingual setting, researchers (e.g., Moll, Díaz, Estrada, & Lopes, 1978) content that learning is primarily situation specific; generalizing to other situations depends upon organizing the environment to facilitate application to a different setting. Therefore, lesson environments have to be constructed so children will perceive that what they have learned in Spanish reading class is also applicable in English class and vice versa. This suggests that the instruction in the two languages should be closely coordinated. It also suggests that planning and teaching for transfer of learning should be included in the training of teachers who work with bilingual children.

Precursor Skills and Reading Achievement

ISSUE: Entry oral language and pre-reading skills are associated with reading achievement. When compared with children with less well developed skills at entry, children with relatively better developed oral language and pre-reading skills at entry were better able to take

advantage of the instruction offered and to maintain their relatively superior level of attainment in reading throughout the primary grades.

IMPLICATIONS: Entry English language skills have pervasive and lasting effects on English reading achievement throughout the early elementary grades. While the oral English growth rate of the overall sample proceeded at a rate above the expectations of the growth track model, the Low English entry students' growth rate was greater than that of the High English entry group. However, the two groups did not converge until late fourth grade. This suggests that acquiring "school-related" skills in a second language takes time. An important question for educators is, "What are effective intervention strategies for ensuring academic progress during the years while these children are in the process of gaining the necessary proficiency in English?"

An additional important challenge for educators is to find means to ensure, and perhaps accelerate, language and reading growth of students who at entry into school are deemed by their teachers to have relatively low level verbal skills. These are the children who may get off to a slow start in school, gain somewhat less than a year of growth for a year of instruction, and fall further behind their more academically-prepared peers as they progress through the early elementary grades.

Nominal Instructional Program and Reading Achievement

ISSUE: The investigators examined the degree to which the number of years students were enrolled in a Spanish reading program could account for reading achievement within each of the instructional years. For Spanish literacy, enrollment in Spanish reading programs is positively related to reading achievement during the early grades, but this relationship becomes negligible in the later grades. Children who are placed in these programs are generally those deemed by the schools to be limited in their English skills and to have stronger skills in Spanish than in English when formal reading instruction is begun, usually in first grade. These children remain in Spanish reading programs until they reach a predetermined level of oral proficiency in English and attain a specified level of reading in Spanish and/or perform at or above a specified percentile score on a standardized test of reading achievement in English (usually the 40th percentile). In this study, some students received Spanish reading instruction for one year before being transferred to English reading; others remained in Spanish reading for two, three, or four years, with most being transferred to English reading by the end of third grade. After transfer to English, no further reading instruction in Spanish was provided, except during a brief "transition" period in some schools. With such criteria for transfer, the few students who remained in Spanish reading programs beyond the third grade likely were children who were having trouble learning to read, since the oral English skills of most of the students by third grade exit tended to meet or exceed the oral English criterion for transfer.

IMPLICATIONS: While acquired English literacy skills were found to be generally negatively associated with numbers of years of enrollment in Spanish reading programs, there is some indication of relatively superior English literacy skills at fourth grade exit for those students with longer (longitudinal) enrollments in Spanish reading programs. Although the sample was limited for this instructional year, this trend in the data raises some interesting questions. For children who begin initial reading instruction in Spanish is there a threshold level that must be reached in Spanish reading for the benefits of such instruction to affect positively growth in English literacy? If so, does it correspond to the level of literacy that monolingual children normally achieve by the end of third grade? Are children in transitional bilingual education programs, where criteria for transfer to English reading is strongly tied to English performance, being kept in Spanish reading programs long enough to attain the requisite literary skills in Spanish? Does the time frame of this study, kindergarten through grade four, capture the long-term effects of initial reading instruction in the non-English home language? These and related questions merit attention as they are central to the current controversy surrounding transitional bilingual education.

Quantity and Quality of Instruction

ISSUE: To what extent does the quantity and quality of the instruction delivered to bilingual children affect reading achievement? Of the many factors affecting student progress in reading, instruction is the one for which the schools have primary responsibility and over which they have the most control. Identifying instructional patterns associated with success and failure, both in the early stages of reading instruction and in subsequent years, is a critical issue surrounding improvement of practices for all children.

Educational research over the last 10 to 15 years, conducted primarily with students from the general school population, has produced a solid knowledge base allowing educators to point with confidence to characteristics and actions that differentiate between instructional settings in which students successfully master the learning goals set for them and those in which students are less successful. It identifies and describes what effective teachers do and how effective instruction is accomplished in effective schools. Similarly, some of the most eminent reading experts claim that the best teachers in the best schools know how to turn students into proficient readers (Anderson, Hiebert, Scott, & Wilkinson, 1985).

Research in bilingual education and related topics has also accumulated a substantial knowledge base in the last 10 years. The focus on academic achievement in the late 1970s and early 1980s led to more and more investigations into the interaction between differences in the languages of instruction and the student. This in turn uncovered a variety of variables that prompted research into school and classroom climate, teacher and student variables, and pedagogical, sociocultural, and legal issues. Thus, a considerable body of

research exists that speaks directly to issues related to language minority education.

When examining the findings from the instructional data from the present study in relation to the knowledge base of other literature, one finds instructional patterns and teacher behaviors associated with student academic gains in monolingual classrooms, successful practices in bilingual classrooms, and less reading gains in monolingual classrooms.

Practices Associated with Student Academic Gains

Factors present in the data associated with student academic gains and successful practices in both monolingual and bilingual classrooms include the following.

-- Strong focus on academic work; time spent working with textual materials (as contrasted to time spent with non-textual materials).

-- Time allocated to reading and academic verbal interaction; literacy skills tend to show greater improvement with increased exposure to instruction -- the more opportunity for learning the greater the skill acquired.

-- Use of active teaching practices; relatively large amount of instruction from and interaction with the teacher.

-- High achievement expectations; use of tasks of appropriate difficulty level that challenge the student, yet allow consistent success.

-- Efficient classroom management; allocated instructional time devoted to instruction; classrooms that are relatively free of major behavioral disorders.

Additional factors associated with successful bilingual classrooms include the following.

-- use of the home language with Limited English Proficient students some of the time.

-- Use of English primarily during English-medium instructional periods and Spanish primarily during Spanish-medium instructional periods.

Practices Associated with Less Student Gains

Factors associated in the present study with less student gains in reading as well as those identified in research on monolingual students may be summarized as follows.

-- Amount and quality of decoding instruction (inappropriate amounts or timing of such instruction; non-explicit instruction on letter-sound pairing).

-- Limited attention to explicit instruction in developing vocabulary (word meaning) and higher-order comprehension strategies (beyond those of comprehension of literal facts).

-- Ability grouping of students, which may not be in the best interest of low achieving students. Children assigned to the lower groups are locked into an instructional track in which the range of instruction is such that they have limited opportunity to learn more than a narrow range of the skills and content they need to become fluent readers.

-- Extensive use of seatwork assignments for low reading group students. Recent research suggests that seatwork is qualitatively a different experience for lower achievers than for high achievers. The two groups differ in fluency of their answers and the appropriateness of strategies they use. This may explain why achievement differences widen over time. Low achievers are spending less of their seatwork time in beneficial ways.

IMPLICATIONS: The classrooms in this study exhibited several of the characteristics of effective instruction. For the students (in the aggregate) such instruction produced approximately a year of growth for a year of instruction in English reading comprehension, as measured by performance based tests. Instruction <u>does</u> make a difference.

While the classrooms were similar in many ways, variation was noted on the quality of the dimensions of instruction assessed. This suggests that to ensure effective instruction of all students, certain instructional dimensions need strengthening. Staff development should aim toward training teachers to (a) monitor their own use of language in the classroom and to provide instructional activities making strong formal language demands on students; (b) make optimal use of textual materials, favoring these over non-textual materials in both direct instruction and independent work; (c) increase instruction in word meaning and the higher-order comprehension skills and to strengthen such skills through explicit instruction; and (d) evaluate the decoding needs of their students and tailor their instruction on decoding to the identified needs, making such instruction explicit and limited to appropriate amounts. In addition, the practice of grouping students for instruction needs careful consideration, not only in terms of optimal size, but also in terms of student membership, permanency of the group once formed, and instructional treatment provided.

Site Characteristics and Reading Achievement

The sites in this study were selected to achieve variation in several areas (e.g.,size, socioeconomic status, degree of urbanicity, concentration of Hispanic students, characteristics of the reading program). Given differing contextual environments, site differences in language and literacy development could be expected. For English, site contrasts in such development were relatively isolated, suggesting that schools were adjusting schooling practices and instruction to meet the needs of the local school population. Spanish literacy, on the other hand, was more advanced at certain of the border sites where substantial non-school support for Spanish was available.

IMPLICATIONS: Factors outside the school are important in maintaining and/or fostering development of the non-English home language. Prominent among these are locale and the extent to which the language is used in the community and the wider environment, as well as the role of the home language in the affairs of the home and of the community; attitude of the student and others toward the maintenance of Spanish; and the extent to which written materials and formal usage are available to the students in the home language.

Without strong support from the home and the community, students in transitional bilingual education programs are unlikely to achieve high levels of literacy in Spanish. Indications are that these programs can, and are, promoting English literacy for all students, and in the case of the present study, slightly more than half of the students were reading in English at grade level expectations by the end of second grade.

RESEARCH DESIGN

Some elements of the research design have been presented briefly in preceding sections. A more comprehensive summary is provided in the following pages.

To achieve the objectives of the study, considerable attention was given to the selection of schools, teachers, and students; the instruments for assessing language and reading achievement; the methods for assessing classroom instruction; and the data analysis plan. Each of these topics are discussed briefly below.

Sample Description

Having determined the goals of the study and that low-income Hispanic children enrolled in bilingual programs in the State of Texas would be the primary focus of the study, a purposive rather than a probability sampling procedure was selected. The plan included sampling at five units of analysis: region, school district, school, teacher/classroom, and student.

The general approach was to start at the highest level of the chain with the selections of regions, then proceed to sampling at lower levels, using data available at each point to establish fixed categories from which samples were to be taken. Data compiled by the Texas Education Agency and previous work at SEDL suggested that two or three general types of bilingual education programs could be identified with two or three reading approaches nested within, or across, the bilingual programs.

Site Selection

The initial selection of sites was based on dividing the state into geographical regions that took into consideration a combination of regional, political, socioeconomic status, language, and degree-of-urbanicity variables. The following three geographical regions were then selected.

Central Texas -- a region that is both urban and rural and contains a number of bilingual programs.

Texas Border Area -- rural, low socioeconomic status, substantial numbers of Spanish dominant students.

North Central Texas -- large urban area, largely monolingual English, middle-sized cities, poor and middle class.

Selection of School Districts

Within each region, four to eight school districts were identified for potential inclusion in the study. Ultimately, five districts were selected that broadly represented the variables of interest -- size, socioeconomic status of local community, degree of urbanicity, nature of the bilingual program, degree of variability of schools and teachers within the district, and willingness to cooperate in the study.

Selection of Schools

Schools were selected within each of the districts on the basis of such variables as, but not limited to, the nature of the bilingual program, nature of the reading program, and character of the school organization (e.g., multiple grading, team teaching, open classroom configurations, and individually-guided education programs). Fourteen schools were selected from which the student sample was initially drawn. As the students moved through the grades, six additional schools were involved.

Selection of Teachers/Classrooms

Data available at the district and school level were used in the selection of teachers. Variables considered in teacher selection, as students entered the study initially, included number of years of

experience, specialized training in reading and bilingual education, number of years at the present school, and qualifications and role functions of the teacher aides.

As students moved to the next grade, they were often dispersed throughout all appropriate classes available in their school at that grade level, as the study had no control of student placement beyond the students' initial year in the study. At first, the student sample was assigned to 26 homeroom classes. However, because of team-teaching and other organizational approaches, 37 teachers constituted the initial teacher/classroom sample.

Selection of Students

The students' language and reading skills were assessed with a variety of instruments, and their instructional programs and classroom instruction were observed and documented. For some purposes, all of the students in a class were tested with certain instruments; for other purposes, the instructional program of the entire class was observed. In addition, a target subsample of 10 students was selected in each class for a more detailed, longitudinal "case study" examination.

The primary factors for the selection of target students within a classroom included sex, language status, and an index of cognitive style.

In sum, the five Texas sites selected represented a cross-section of school districts typically found in the state and reflect variation in size, socioeconomic status, urbanicity, locale, and makeup of the student body (from medium to high concentration of bilingual students). They also reflected a high degree of diversity in terms of curriculum used, organization for instruction, criteria and practices for transition from Spanish to English reading, and instructional emphasis. Thus, the naturally occurring variations necessary to the design of the study were found in the sites included in the study.

Cohort Plan for Longitudinal Investigation

To achieve the purpose of the study, it was desirable to track the target students from entry into kindergarten through the end of fourth grade. The growth and development that are the focus of the study normally takes place over this time period, and a cross-sectional design would have been altogether inappropriate.

For practicality, what was planned and implemented was the selection of cohorts (groups) of relatively modest sample size that were tracked for varying periods of time in successive waves. Four student cohorts of differing sizes entered the study during the course of a three year period. Each cohort of students was tracked from their entry into the study through the last data collection year (1982-1983) or until they exited fourth grade. The selection

procedure yielded a subsample of 380 students distributed among the cohorts as follows:

Cohort 1: Year 1. Site 0 - 2 schools, 4 classrooms, 40 target students (20 K; 20 F).

Cohort 2: Year 2. Site 0 - 2 additional classrooms, 20 students (K); Site 1 - 1 school, 2 classrooms, 20 students (10 K; 10 F); Site 2 - 1 school, 4 classrooms, 40 students (20 K; 20 F).

Cohort 3: Year 3. Site 3 - 1 school, 3 team teaching units, 80 bilingual students, 10 monolingual English (all K students); Site 5 - 7 schools, 11 classrooms, 80 bilingual students, 30 monolingual English (all K students).

Cohort 4: Year 3. Site 4 - 2 schools, 4 classrooms, 60 monolingual Spanish students (all first graders).

Since the students entered in successive waves, with most of the students entering during their kindergarten year but with some entering at first grade, certain of the students were tracked for five years (K-4); others for four years (K-3 or 1-4); yet others -- the majority -- were tracked for three years (K-2).

Instrumentation and Data Collection

Data were collected in accordance with a data collection schedule that was prepared each summer and distributed to data collectors prior to the beginning of the school year. Two major sets of instruments were administered each year, one assessing student characteristics and academic performance, and a second providing information on teacher characteristics and classroom instruction. A brief discussion of these data sources is given below.

Student Characteristics and Academic Performance

For students, the study's primary interest focused on language and literacy growth. The instruments employed in the assessments of these skill areas are described below.

Language Assessment

Several types of data were collected for each student concerning their oral language proficiency in both English and Spanish. At the beginning of each year, teachers provided a general characterization of their students' language in terms of English-Spanish dominance, employing the Student Operational Language Assessment Scale (Duncan & DeAvila, 1976). In late Fall (after becoming more familiar with their students) and again in late Spring, teachers provided a more detailed rating of their students' language skills employing the Oral Language

Proficiency Rating Scale (Mace-Matluck, Tunmer, & Domínguez, 1979). Standardized oral language proficiency tests, selected by the district from those allowed by state policy, were administered in the early Fall of each year, the test almost exclusively selected being the Language Assessment Scales (DeAvila & Duncan, 1977). Finally, for a subsample of the target students, audiotaped speech samples were obtained monthly on a rotating schedule in three settings: the classroom, the playground, and the home.

Reading Assessment

Several instruments were used to measure reading achievement. First, detailed information was obtained from two individually administered "performance based" tests assessing both English and Spanish literacy skills.

In the Fall of kindergarten, the Stanford Foundation Skills Test (Calfee & Associates, 1978, 1980; Calfee & Peña, 1978, 1980) was administered to assess pre-reading skills, providing independent measures of visual discrimination, phonetic segmentation, alphabet knowledge, vocabulary knowledge, and narrative comprehension. From the end of first grade on, the Interactive Reading Assessment System (Calfee & Calfee, 1979, 1981; Calfee, Calfee, & Peña, 1979) was administered during the Spring of each school year to assess reading skills *per se*. This instrument provided independent measures of skills in decoding, spelling, word meaning, fluency in oral reading, and listening and reading comprehension.

As supplemental information, informal reading inventories were administered throughout the school year after the reading of connected text began. Finally, standardized achievement test scores from Spring district-wide administrations were collected yearly in both English and Spanish (though the latter were rarely administered in the study's sites).

Classroom Observation and Teacher Interviews

Project staff conducted monthly observations of the reading instruction in each classroom and interviewed the teachers quarterly about their instructional plans. The observation instrument, the Reading and Mathematics Observation System (Calfee & Calfee, 1976, 1978), documented staffing patterns, grouping and organization, time allocations, the language of instruction, the character of instruction, the materials and procedures used, and the response of the students. The interview instrument, the Reading Teacher Checklist (SEDL, 1978), focused on the teachers' general instructional objectives for reading, as well as the objectives for individual target students. Finally, through the Bilingual Classroom Questionnaire (SEDL, 1979) and its revision as the Inventory of Bilingual Instruction (SEDL, 1981), overall program information was collected through interviews with teachers about their daily schedule (as opposed to only their reading instruction periods). Together, these instruments provided a rich characterization of the instructional program for the target students.

Other Data Collected

Other data were collected and entered into the data system. For students, these included yearly administered cognitive style instruments -- namely, the Matching Familiar Figures Test (Kagan, Rosman, Day, Albert, & Phillips, 1964) and the Children's Embedded Figures Test (Witkin, Oltman, Raskin, & Karp, 1971) -- and a Piagetian cognitive development instrument, the Cartoon Conservation Scales (DeAvila, 1976). For teachers, these included a corresponding set of yearly administered cognitive style instruments -- namely, the adult version of the Matching Familiar Figures Test and the Group Embedded Figures Test (Consulting Psychologists Press, 1971) -- and an instrument designed to ascertain the teachers' background characteristics and language skills, the Survey of Teacher Background and Language Skills (SEDL, 1980). These data have not been fully analyzed, some because they appeared not to yield productive information for the purposes of the study under initial analyses, others because of their lower priority in the face of limited resources.

Data Collectors

All direct teacher input data were collected by full-time members of the SEDL research team. This required systematic and frequent visits to the research sites.

A data collection team from each of the sites conducted formal classroom observation and collected student data. In most cases, a team comprised two people who were not otherwise employed. All met the following criteria: resident of the local community, experienced teacher, Hispanic and fluent speaker of English and Spanish, and acceptable to the school district. In all cases, the school district administration provided a list of acceptable and available persons who were then screened by the SEDL staff.

Training for the data collectors was extensive and ongoing, with all training conducted by the SEDL research staff, usually at the local site.

Data Management and Reduction

Standard procedures were used in the entry and cleaning of the data, and standard statistical packages (generally SPSS) were then used to obtain descriptive summaries, although a fair number of special-purpose programs had to be written to conduct some analyses (most notably, those concerned with the instructional data).

The goal of the data management procedure was two-fold. First, the creation of raw measure data sets that respected the yearly cohort structure of the study (mainly for the purposes of establishing measurement reliability given instrument modifications over the years of data collection). Second, the creation of an integrated data base

across cohorts that respected distinctions in grade level (more accurately, instructional year), such that for each individual student a series of measures existed that was in all ways congruent with the series for every other student in the study.

The goal of the data reduction process was to obtain a reliable total score for each subscale of the instruments used in the study, and then, guided by the study's theoretical concepts, to reduce the data structure to a manageable set of relatively independent indices. As such, the analyses to date have treated only the gross features of the data base. Much more detailed analyses treating the data's fine grain have been left for future work.

Data Analysis

In this section, the approaches taken to the analyses of the data base are summarized. First, an overview of the procedure used in the measurement of growth is presented, followed by a description of the techniques employed in the assessment of instruction. Finally, the approach taken to assess the effects of entry skill and instruction on subsequent literacy performance is discussed.

The Measurement of Growth

Given the selection of instruments in oral language and reading and the summary indices of performance associated with each for each instructional year, the problem of assessing growth for individual students over the semesters in which they may have been tested with a given instrument was next addressed. The solution was derived from the account of growth in the set of component reading skills assessed in the Interactive Reading Assessment System (IRAS), and was then applied to student performance on other instruments as appropriate. As an aid to the explanation of this approach, a brief discussion of the IRAS follows.

IRAS incorporates the developmental dimensions of basal readers for each of the major components of the separable-process model of reading on which it is based: decoding, vocabulary, and comprehension. As an example, in assessing real-word decoding, the IRAS materials were selected using word-frequency lists according to a linear progression in readability (i.e., students were asked to read word lists ordered by the word frequency of their constituent words). To the degree that the basal materials drive student growth in reading, then a year of effective instruction should correspond to a constant amount of progress through the levels of IRAS. That is, the structure of the IRAS materials incorporates a linear component, and therefore, leads to the hypothesis that growth as measured over these material sets should be largely linear.

Accordingly, for each student, performance within a given IRAS subtest over the years tested was assessed by projecting the best-fit regression line through the set of available data points for the given

subtest. Such a line summarizes student performance in the relevant task by providing estimates of (a) the intercept, representing the skill level at which the student began schooling (actually, the intercept at first-grade entry was computed rather than at kindergarten entry, since this point seemed to be the modal value of the sample's first systematic instruction in literacy) and (b) the slope, representing the average growth, in terms of IRAS levels, for a single year of instruction.

The degree to which the data actually reflect a significant linear component may be assessed by computing the amount of variability around the individual student's best-fit line. This index is one minus the r-squared value, the latter expressing the squared correlation coefficient between scaled subtest performance and grade level. When converted to a percentage, values of 100% are obtained when the data show no linear component (i.e., the average of the data values is the best estimate of performance for any grade level). At the other extreme of 0% unexplained variance, each of the data values falls precisely on the projected line, and subtest performance is perfectly predictable for any grade level. For values between the two extremes, some linear component is present in the data: As the percentage of unexplained variance decreases, so does the average (linear) prediction error, indicating a relatively larger linear growth component.

For the IRAS growth indices, the average unexplained variance over the English subtests was 19.6% (ranging from 12.9% to 33.9% over the nine component scales); for the Spanish subtests, the average unexplained variance was 26.4% (ranging from 14.8% to 37.9%). These values indicate that, on average, a large degree of growth as measured in the IRAS component subtests can be explained as linear.

Growth in language, as revealed in certain measurement schemes, may not be expected to be linear since the "materials" used to assess language growth may not have been designed in a fashion comparable to the IRAS design. Nonetheless, language growth does show evidence of a linear component, although it is not as substantial as that found in the IRAS indices. For growth in language as assessed by the Language Assessment Scales (LAS), the average unexplained variance for the averaged four multiple choice response scales (Minimal Sound Pairs, Lexical, Phonemes, and Sentence Comprehension) was 23.3% and 32.3% for the English and Spanish indices, respectively; 41.9% and 39.9% for the production rating in English and Spanish, respectively; and 33.2% and 42.9% for the overall level rating in English and Spanish. For the teacher ratings comprising the Oral Language Proficiency Rating Scales (OLPRS), the average percent of unexplained variance was 45.0% and 39.3% for the English and Spanish ratings, respectively. Thus, these sets of language data also reveal linear growth components, though they are not as strongly evidenced as in the IRAS data.

In summary, two points are important to remember when considering the descriptive data based on this analytic procedure. First, the average growth measures presented are based on the best-fit lines

projected through each individual student's available data points for a given measure. Second, the fits of these lines to the data are, in general, fairly good, but they do not represent the whole story, as indicated by the varying degrees of unexplained variance.

The Assessment of Instruction

The instruction provided the target sample was documented through two major information sources. The first was through regular classroom observations (approximately five to six per year) employing the Reading and Mathematics Observation System (RAMOS). The second was through regular reading teacher interviews (approximately three per year) employing the Reading Teacher Checklist (Checklists).

The observation instrument consisted of a number of distinct categories of instructional interest (delineated below). Associated with each category was a set of mnemonic codes that detailed the contents of the category (e.g., under the category of Instructional Focus, a large set of codes was used to describe the possible foci, from letter-sound correspondence work to whole word recognition, to text comprehension). For each minute of observation, the observer entered the codes describing the classroom activities under each category, thus providing a minute-by-minute account of the classroom instruction observed. From these sources of instructional data, indices of both the quality and quantity of instruction with respect to a set of instructional dimensions were derived. The particular dimensions of instruction assessed for each individual target student from the observation-based summaries included the following.

Number of Students: the number of students contained in the instructional group.

Classification: the level of the instructor's formal training, ranging from minimal (volunteer) to mid-level (teacher aide) to substantial (substitute teacher, resource teacher, teacher).

Role: the level of formal instruction provided, ranging from minimal (preparation, control, management) to mid-level (facilitation) to substantial (direct instruction).

Subject Matter: the amount of reading generally required by the subject being taught, ranging from minimal (class business, art) to mid-level (science, mathematics) to substantial (reading).

Instructional Focus: the relative explicitness of the instructional emphases and strategies employed in three instructional subcategories:

Letter-Sound Unit: the relative explicitness of the instructional emphasis placed on decoding, ranging from work on isolated units (auditory discrimination, letter recognition, letter-name work) to non-explicit letter-sound pairing (whole word recognition, spelling practice) to explicit

letter-sound pairing (letter cluster-sound recognition, letter-sound recognition, spelling pattern recognition).

Word Unit - Meaning: the relative explicitness of the instructional emphasis placed on word meaning, ranging from low (dictionary usage) to mid-level (noun derivative, compound words) to high (antonyms/synonyms, vocabulary enrichment).

Sentence and Text Units - Meaning: the relative explicitness of the instructional emphasis placed on sentence and text meaning, ranging from low (literal facts) to mid-level (story sequence, predicting events) to high (major ideas, making inferences).

Technique: the type of technique in which skills of visual or auditory pattern recognition were presented, as either parts-to-whole or whole-to-parts.

Language of Instruction: the language used in instruction delivery, ranging from all Spanish to alternating usage of English and Spanish to all English.

Materials (Primary and Ancillary): the amount of text contained in the materials used, ranging from minimal (art material, tape recorder) to mid-level (phrase card, chalkboard) to substantial (basal reader, library book).

Activity/Task: the level of formal language demand required by particular activity/tasks in three instructional subcategories:

Non-instructional: the type of instructional activity/task, as either non-instructional (clean-up, wait time) or instructional (all other activity/tasks).

Independent: the level of formal language demand for activity/tasks classified as independent work, ranging from minimal (art activity, copying material) to mid-level (writing from dictation, writing answers) to substantial (test taking, creating writing).

Listening and Responding in Group: the level of formal language demand for activity/tasks classified as listening and responding in groups, ranging from minimal (music activity, playing games) to mid-level (watch-listen, listen-story) to substantial (listen-lecture, discussion-speak).

Attention (Collection Years 1-2): the attention of the instructional group as rated relative to the activity/task required, ranging from low to medium to high.

Number of Nonengaged Students (Collection Years 3-5): the number of students contained in the instructional group who were not engaged in the activity/task being conducted.

Productivity: the rated productivity of the instructional group, ranging from low to medium to high.

Noise: the level of noise as rated relative to the activity/task required, ranging from low to medium to high.

Over the five years of data collection, 1640 observation-based summaries for individual target students were obtained (1293 in English reading and 347 in Spanish reading, the difference reflecting the predominance of English reading offered to these students).

For the interview-based summaries, the particular dimensions of instruction assessed for each individual target student matched those of the RAMOS with the following exceptions, which were not appropriate for the teacher interviews: Subject, Technique, the set of student response indices (Attention, Number of Nonengaged Students, Productivity, and Noise), and transitional activities (Activity/Task: Non-instructional). Two additional categories not found in the observations were included in the interview:

Number of Basals: the number of different basals planned for use in the delivery of the instruction.

Rank: the relative position of the target students' reading group with respect to the following criteria:

Internal: the relative ranking of the target students' reading group with respect to the other reading groups of the classroom, ranging from low (one of the lowest reading groups) to mid-level (the average reading group) to high (one of the top reading groups).

External: the relative ranking of the target student's reading group with respect to the grade level expectations of the basal reading series employed, ranging from low (below grade level expectations) to mid-level (at grade level expectations) to high (above grade level expectations).

In these interviews, teachers were asked to indicate the general strategies employed in teaching reading to each of the target students, supplying for each, detailed information under the instructional categories of interest (using the same coding scheme employed in the RAMOS), and the relative amounts of time to be devoted to each strategy over the two-week period covered by the interview. Over the five years of data collection, 1943 interview-based summaries were obtained of the instructional plans for providing reading instruction to individual target students (1393 in English reading and 550 in Spanish reading).

Such scaled instructional indices (for both the observation-based and interview-based summaries) represent a set of instructional dimensions with respect to both their quality (reflected in the relative

magnitude of the scaled values) and quantity (reflected in the percent of time devoted to each instructional dimension). The use of the term "quality" here does not imply any evaluation of the appropriateness of the instruction, as the skills of the students in a given group may be such that certain types of instruction are obviated. However, this information provides a basis for assessing the kind of instruction received (i.e., its quality and quantity relative to the dimensions defined in this study), and subsequent analyses provided assessments of whether or not instruction so defined influenced the growth of relevant skills of these students.

The findings from the descriptive data based on these summary indices are discussed below. However, these indices were not employed in the integrative analyses. Rather, aggregated indices based on factor analyses (conducted independently for both the observation and interview data, and for English and Spanish reading instruction within each) were used. The summaries derived are described below.

The seven factors identified in the English observation analysis were: (a) engaged text time, an index of reading time where students were engaged with text materials, (b) direct group instruction, an index of direct instruction that was aimed at groups rather than individual students, (c) the quality of formal language, an index of the formal language demands made upon the students, (d) the amount of decoding instruction, (e) student productivity, (f) the use of secondary materials, and (g) the number of students constituting an instructional group.

The seven factors identified in the Spanish observation analyses were: (a) quality of formal language (corresponding to the third English factor derived), (b) direct group instruction (the second English factor), (c) engaged text time (the first English factor), (d) number of students (the last English factor), (e) amount of decoding (the fourth English factor), (f) secondary material usage (no general corresponding English factor) and (g) control (a complex factor also without an English correspondence).

The five factors identified in the analysis of the English interview data were: (a) the amount of comprehension instruction, (b) the quality of formal language, (c) the amount of seatwork, (d) the quality of primary materials, and (e) the amount of group vocabulary instruction.

For the Spanish interview data, the five factors identified in the analysis were: (a) the amount of decoding instruction (the complement of the first English interview factor), (b) the amount of seatwork (corresponding to the third English factor), (c) the quality of primary materials (the fourth English factor), (d) the decoding teacher's classification, which was also associated with the explicitness of the decoding instruction planned (no English correspondence), and (e) the number of students in the instructional group (no English correspondence).

Integrative Analyses

A gross analytic strategy was selected to gain some initial sense of the overall structure of the data base linking precursor skills and instruction to reading achievement. This approach is best viewed as a preliminary analysis of an extraordinarily complex data base -- multiple, yearly student assessments in the domains of cognition, language and reading (in both English and Spanish for the latter two), coupled with extensive yearly instructional data. The primary goals of the analysis were (a) to determine the degree to which the several predictor indices were consistently related to the outcome variables and (b) to evaluate the structural patterns of any such relations.

The primary outcome measures employed in these analyses were the nine summary indices obtained from the nine subtests found in the IRAS, analyzing English and Spanish performance separately. For convenience in interpretation, these indices may be grouped into three major categories: (a) oral language (Vocabulary Definition, Narrative Listening Comprehension, and Expository Listening Comprehension), (b) Word/Sentence Decoding (Vocabulary Decoding, Synthetic-word Decoding, Synthetic-word Spelling, and Sentence Reading), and (c) Reading Comprehension (Narrative Reading Comprehension and Expository Reading Comprehension).

For each year that a student was tested, a deviation was computed between each of the student's IRAS measures and the aggregate growth track index summarizing average performance during that year. The IRAS deviations for each year were then submitted to a regression analysis in which the predictors included (a) precursor indices (oral language classification at entry to school and previous year's performance on the corresponding IRAS measure) and (b) instructional dimensions (the nominal reading program, the observation-based and interview-based indices of instruction, attendance, and site at which the attended school was located).

The major disadvantage of this approach can be easily stated: Because each year is considered in isolation from the others, there is a loss of information about the longitudinal character of changes in reading achievement. Likewise, there is a loss of information about the configurational patterns relating changes in instruction to changes in achievement. Other analytic procedures are possible, but they require more resources than were available for these analyses.

Preliminary to the regression analyses proper, the correlations between the set of predictors and the set of outcome measures were carefully examined, as were those among the set of predictor variables. The derivation of each of the predictor variables is briefly described below.

Precursors

The first precursor, oral language level on entry to kindergarten, was determined for both English and Spanish as a two-level

category (median split) based on teacher ratings. As it happened in this sample, oral language competence was virtually independent on entry to kindergarten. Analyses of variance conducted for each of the IRAS longitudinal measures with English and Spanish language ratings as the independent factors showed that the English IRAS measures were generally affected by the English language rating, and the Spanish IRAS measures were generally affected by the Spanish language rating with little evidence of systematic interactions between the two. Accordingly, in all of the regression analyses, oral language as a precursor was simply represented by the corresponding language rating around the median split.

A student's achievement level at the end of a given school year is generally related to performance at the beginning of the year. Accordingly, an index of previous performance was included as a precursor. From second grade on, the corresponding IRAS deviation served as the index. For first grade achievement, the Alphabet Knowledge subtest from the Stanford Foundation Skills Test (SFST) was employed. For English, awareness of the letter names is known to be correlated with later reading achievement, for reasons that are not entirely clear. The distribution of scores on this subtest was bimodal in this sample, replicating earlier findings, and so this precursor was reduced to a dichotomous contrast.

Instruction

Two indices of a student's status in a bilingual reading program were employed in the regression analyses. The first was the total number of years of assignment to Spanish reading instruction of any sort (ranging from 0 to 5), and the second was a dichotomous variable indicating whether the student was assigned to Spanish reading instruction during the particular instructional year under analysis.

Specific instructional dimensions were based on the seven RAMOS and the five Checklist factor scores. English instructional summaries were used in the regression analyses for English IRAS deviations and Spanish summaries for Spanish IRAS deviations.

Attendance data were provided every year by the districts for each student, and the percentage of days attended during the given instructional year was used as the index of school attendance.

Finally, since the study was conducted at five different districts, a set of orthogonal contrasts were introduced as the last step in the regression analyses in order to assess any other between-site effects that were not included as part of the other influences (i.e., the precursor and instruction indices).

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